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THE increase of heart rate during work reflects the severity of the job, the physiological strain on the cardiovascular system, and the physical work capacity of the individual. In the face of a decrease in work capacity or cardiovascular reserve, a standard level of physical activity should produce an increased heart rate. In a group of 765 men whose major occupation was mining coal, pulse rate responses were measured on a standard graded work test, with work oxygen increments of about 360, 450, 600

and 1000 ml./min. Pulse rates increased with higher work levels, but at none of the work levels was there a consistent increase in work pulse rate with increase in age. At the higher work rate there was a trend toward decreasing pulse increment with increasing body weight. Work oxygen consumption expressed in ml./kg./min showed the same trends. Obviously a lifetime of hard work did not appear to alter the ability to meet the cardiovascular demands of work requiring 50% of man's average maximum oxygen capacity.

## SESSION VII: Paper 3

### Motivation for Sports Participation in the Community

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IN considering sports motivation, two basic assumptions are made: first, that active physical exercise is good for adults of advancing years; second, that sports participation is more enjoyable, and more likely to keep an individual involved over the years, than is a system of set exercises. Since this paper is limited to motivation, no specific effort will be made to defend the basic assumptions. The question of community motivation will be approached through the motivation of individuals.

This is a field in which scientific measurement is difficult, and so the factors in sports motivation were studied by means of interviews with a representative group of adults currently active in sports. It is recognized that such a group is not necessarily representative of the population at large. It is understandable also that, in view of my personal interest,<sup>†</sup> examples will be chosen from the sport of skiing.

It became apparent, after a number of interviews, that at least two sets of motives were involved in sports participation. Considerable variation was noted in the motives which lead to initial sports involvement. The motives which lead to *continued* sports involvement were much more uniform. Naturally, there was some overlapping in the two areas.

Motives involved in initial sports participation are shown in Table I. M.S. and T.S. became active skiers because of their son's involvement as a ski racer: M. primarily because of pride in his son's accomplishments, secondarily because of his desire to be with his son as much as possible; T. primarily because she did not want to be left at home alone, but also secondarily because of *her* pride in her son's accomplishments.

K.T. and E.L. became involved in active sports because of fear of incapacitation and decrepitude, K.T. because of severe arthritis of the spine and peptic ulcer, E.L. because of recurrent carcinoma. K.T. climbed his first mountain at age 47, and subsequently climbed more than 150 major peaks, setting many speed-climbing records. Taking up skiing in his fifties, he set a marathon cross-country record in Norway still unequalled, even by much younger skiers. E.L., almost completely invalided at 65 following recurrent carcinoma, a series of surgical procedures and radiation therapy, climbed a nearby mountain two months after he had been sent home to await his end. Two years later he broke the speed-climbing record for a 9300-foot peak. He subsequently climbed many higher peaks, including Mount Shasta, over 14,000 feet. At 70, he seems to think little of running 10 miles a day.

B.Q., in his late thirties, and P.D., in his mid-fifties, both became involved in sports because

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TABLE I.—MOTIVATING FACTORS RESPONSIBLE FOR INITIAL SPORTS PARTICIPATION

	<i>Motivation for initial participation</i>								
	<i>MS</i>	<i>TS</i>	<i>BS</i>	<i>KT</i>	<i>EL</i>	<i>SE No. 2</i>	<i>PD</i>	<i>BQ</i>	<i>SE No. 1</i>
Parental pride.....	*	+							
Fear of loneliness.....		*							
Parental encouragement.....			*						
Fear of incapacitation.....				*	*				
Desire for buoyant health.....	+	?		+	+	*	?	+	
Competitive drive.....	+	?	+	+	+	+	*	*	*
Reassurance.....	+								
Athletic past.....	+			+	+	+	+	+	
Family tradition.....		+	+	+					
Congenial companionship.....	+	+	+	?	?	+	+	+	
*Primary motivating factor.									
+Secondary factor.									
?Probable but unconfirmed factor.									

of their competitive drive, the urge to excel. S.E., in his late forties, became involved originally because of competitive drive, but feels that his primary motivation at present is the desire to maintain the best possible health status. All three remain participants in year-round sports programs.

It is of interest that B.Q., P.D. and S.E. have been life-long sports adherents. K.T. and E.L. were both active in sports when younger, but were then relatively inactive for a period of years. Both, however, evidenced strong competitive drive. M.S. was modestly involved in competitive sports in school and college, but then was not involved in any way except for minor activity in hunting and fishing until he took up skiing at the age of 55. T.S. had almost no sports background until she started skiing at 43, but there was a strong family history of competitive sports. M.S. admits a strong competitive drive, though T.S. deprecates "competition for competition's sake alone". Her friends might not agree.

TABLE II.—MULTIPLE MOTIVATING FACTORS LISTED BY S. E. TO EXPLAIN HIS ACTIVE SPORTS INVOLVEMENT

<i>Multiple motivating factors</i>
Life-long habit
Life-long interest in sports
Love of competition
Good feeling of being in shape
Certain cosmetic values
Improved working ability
Meet a lot of great people

It seemed probable, in reviewing the factors involved in initiating sports participation, that, while there was considerable variation in the primary motivating factors, most if not all of those interviewed had strong competitive drive, most had a family or personal sports background, and several motivating factors were usually present. The multiplicity of motivating factors is illustrated in Table II, which lists S.E.'s motives.

Some of the motives listed in Table II apply to the maintenance, rather than the initiation, of sports involvement (Table III). All of those interviewed as to their continuing interest in sports stressed, or implied, the feeling of well-being that resulted. Accompanying this was a general belief in the adage, "People don't wear out, they rust out," and the conviction that physical activity promoted buoyant health. These relate of course to the fear of inactivity and invalidism reported by K.T. and E.L. The attainment of a desired self-image is an important, though not necessarily admitted, motive. The athlete is usually trim, often tanned, and healthy-appearing in comparison with the flabby, pallid, sedentary individual. And unquestionably, sports clothing, particularly the articles designed for female winter-sports participants, enhances attractiveness.

TABLE III.—MOTIVATING FACTORS IN CONTINUING SPORTS PARTICIPATION. THOSE FACTORS NEAR THE TOP OF THE LIST WERE GENERALLY PRESENT, THOSE NEAR THE BOTTOM LESS FREQUENTLY

<i>Motivation for continuing sports participation</i>
Thrill and enjoyment of sports participation
Feeling of well-being
Challenge of difficult technique, and satisfaction in its mastery
Competitive drive to excel, often in form of self-competition
Congenial companionship with like-minded individuals
Attainment of desired self-image
Maintenance of health and youthful vigour
Escape from crowds and problems
Enjoyment of nature
Pleasure of instructing others

A factor commonly expressed was the challenge of new and difficult techniques, and the thrill of their mastery, a factor which in turn contributed to the attainment of a desired self-image. Closely related to these factors is competitive drive, the desire to excel, so consistently present in those interviewed. Competition was commonly only in relation to the individual's former performance, and rarely against a recognized record, or against another individual.

The introduction of such terms as "19th hole" and "après-ski" into our language indicates general recognition of the sportsman's enjoyment of the congenial companionship of like-minded individuals, though to the sportsman this enjoyment may be keener in the sports activity itself, and in the preparatory phases, than in the after-sports conviviality. The pleasant companionship, such other frequently mentioned factors as the enjoyment of nature and the escape from crowds and from customary anxieties and problems, combine with the factors listed in the paragraphs above to produce what may be sports participation's most important characteristic, the universal recognition that it is fun.

As a means of supplying presumably beneficial exercise, a sport is handicapped because it is ordinarily not a year-round activity. Some persons solve this problem by a rotation of sports, skiing or skating in the winter, fishing, squash, handball during the spring, tennis or swimming in summer, and hunting in the fall. Others, unfortunately, do little, if anything, in off-seasons, but hopefully this number is steadily growing smaller. Some repair to their favourite gymnasiums or athletic clubs; others turn to hiking, climbing or running. Being rapidly bored by any form of calisthenics, being convinced that muscle building as such is of little value, and that the only types of exercise worth while are those that stress the cardiopulmonary system, my principal exercise when I cannot ski is running, two miles of road work daily when at our summer cabin, from 10 to 30 minutes of backyard jogging, where it takes 23 laps to make a mile, spring and fall, and when the weather is inclement, or time too limited, from five to 10 minutes of vigorous pedalling on an exercise bicycle. These activities, combined with walking rather than riding in a car and stair-climbing rather than riding in an elevator whenever feasible, plus 50 "sit-ups" two or three days a week spring, summer and fall, enable me both to fit in my ski pants and to start skiing actively the first day of the season.

How are the lessons learned in a study of individuals to be applied to the community? First we must recognize that, in motivating a community, we are still motivating individuals. We must also remember that some individuals lack a personal and family background in sports, and that some lack the competitive drive seen so consistently in sports-involved persons. Undoubtedly some cannot be reached at present, and will follow along only when the rest of the community is involved. Yet many are in effect waiting for the final stimulus for involvement. It

TABLE IV.—EXAMPLES OF HEADLINES IN PUBLIC PRESS ENCOURAGING ACTIVE EXERCISE AND SPORTS PARTICIPATION

<i>Press Headlines</i>
"Elderly Couple Scale Peak"
"Exercise: Five Minutes a Day Could Add Years to Your Future"
"New Cure for Sick Hearts: Run, Don't Walk, to the Nearest Gymnasium"
"Bicycle Makers Rolling up Record Sales as Adults Discover New Ways to Keep Fit"
"Morris Davis, 67, and Still Race Walking"
"300 State Climbers Attack Slopes of Mt. Adams"
"Actress Runs a Mile a Day"
"Boom for Bike-ways"
"State Board Authorizes Fitness Break"

is towards this group that we should direct our efforts.

What should our approach be? Much has already been done to convey the benefits of physical activity. Admittedly, public acceptance is slow, since such programs have been advocated since the days of Moses, Maimonides and Plato. But we still must keep on trying. In recent years many influential organizations have taken a stand on the value of exercise. Many studies have reported the deleterious effects of inactivity and the benefits of exercise in patients with heart disease, perhaps enough to counter the overstressing of the values of rest and moderation in exercise in mature individuals. It has perhaps been a handicap that some of our leading scientists have refused to take a public stand on the benefits of exercise, though many of them practise what they don't preach. However, their influence may be more than overbalanced by the example of Paul Dudley White, and by the many articles appearing in both the public (Table IV) and professional (Table V) press.

Communities are making sports participation easier by providing public parks, public and private tennis courts and swimming pools, golf courses, skating rinks, ski areas, bicycle paths,

TABLE V.—TITLES AND HEADLINES IN MEDICAL PUBLICATIONS EXTOLLING THE VIRTUES OF ACTIVE EXERCISE PROGRAMS

<i>Medical Publication Titles and Headlines</i>
"Hazards of Inactivity"
"Exercise: Its Therapeutic Value Was Known to Plato"
"Sustained Exercise Programs Urged to Cut Heart Disease"
"Exercise for Coronary Cases"
"Heavy Workout to Fit the Heart"
"Exercise Stressed as Preventer of Heart Disease"
"Vigorous Exercise at Any Age, Even After Infarct, is Upheld"
"Modesto's Rodeo-Riding M.D., Still Competing at Age 63"
"Weightlifting Held to Raise Steroids to Youthful Values"
"M.D. School Faculty Members Conquer Deep Powder Skiing"

bridle paths, and in Scandinavia, ski-touring trails and even trails for runners. In Sweden there are some 2500 bicycle ergometers, in schools, offices, stores, and the like, for self-testing and exercise.

Sports facilities are quite generally available, and the background education of the public has been completed. It is the responsibility of athletes who are also medical practitioners to stimulate their patients and friends, by precept and example, into sports participation.

What of children? Physical activity comes naturally to a child, and perhaps all we need to do is to guide and direct this natural impulse. Children tend to be hero worshippers, and the deluge of sports publicity in newspapers, in magazines, on radio and on television inevitably tends to induce admiration and imitation. The general availability of playgrounds is an important positive factor, and in many parts of our country, fields, streams, lakes and mountains are available for varied sports activities.

Most elementary and high schools now have physical education programs for children not involved in competitive sports. With unimaginative leadership, it is possible that such programs may do more harm than good. With enlightened and inspired leadership, such as that supplied by Fred Batista, of St. Peter's School, Skokie, Illinois, who so stimulated his 1187 pupils that everyone gained an achievement certificate, physical education programs could and should provide the introduction to a life-long sports involvement.

The critical period in sports participation is probably when the carefree youth becomes a breadwinner, and his youthful companion a tired mother and housewife. There is little time, and often less money, available for sports participation. Perhaps this group should simply be encouraged to walk whenever possible instead of using an automobile, to climb stairs instead of

using elevators, and to spend at least part of each weekend hiking, climbing, bicycling or ski touring, if means are not available for other sports activities. With such outlets the young adult may be able to maintain his enthusiasm, and perhaps more importantly, his condition, until affluence provides freer play for his sports inclinations.

#### SUMMARY

Motivation for sports participation was studied in a representative group of adults currently active in sports. While the primary motives in the initiation of sports activity varied a good deal, the fear of incapacitation and the desire for buoyant health were frequent, and competitive drive was almost always present, either as a primary or a contributory factor. Multiple motivating factors were the rule.

In contrast, there was pronounced uniformity in the factors contributing to continued sports participation, the following being always or almost always present: the thrill and enjoyment of sports participation; a feeling of well-being; the challenge of difficult techniques and the satisfaction of mastery; the drive to excel, often in self-competition; the congenial companionship of like-minded individuals; the attainment of a desired self-image; the maintenance of health and youthful vigour; an escape from crowds and problems; the enjoyment of nature; and the pleasure of instructing others.

The public has been exposed to a continuing barrage of stories and articles encouraging exercise and sports participation. Sports facilities have proliferated in an almost endless variety. The time may have come for the medical profession to capitalize on the interest that has been aroused and on the facilities available, through precept and example.

Sympathetic understanding and guidance are needed if the child's natural enjoyment of physical activity is to be directed into permanently useful channels. The critical period for sports participation probably comes in the transition from youth to adult years; efforts should be made to encourage those in this age to participate in inexpensive but rewarding forms of physical activity.